

Explore Weather Trends

Introduction

The goal of the project is to analyze and visualize the local and global temperature data. I have taken 'New York' as local city and compared it with overall global temperature trends. In this project the report focuses on exploring the data, describe similarities and differences between the city and global temperature trends.

The trends about the weather data (local and global) has been visualized using Google Sheets where SQL query is used to extract the data from Udacity SQL workspace.

Data extraction from database

SQL commands used to extract city data and global data are mentioned below. A combined table of city and global data is also extracted for easy observation. The results are downloaded into a .csv format.

Extracting city_data	<pre>SELECT * FROM city_data WHERE city LIKE 'New York' ORDER BY year</pre>
Extracting global_data	<pre>SELECT * FROM global_data ORDER BY year ;</pre>
Extract combined data by joining global and city tables.	<pre>SELECT c.year,c.city,c.country,c.avg_temp as city_avgtemp, g.avg_temp as global_avgtemp FROM city_data as c JOIN global_data as g ON c.year = g.year WHERE c.city LIKE 'New York' AND c.avg_temp IS NOT null ORDER BY c.year</pre>

Data Manipulation

The combined table (.csv format) is opened using Google Sheets. Since we have temperature records for around 250 years, I decided to calculate the moving averages for 10 years. So I added two columns for Global 10 yr MA and NY 10 yr MA. Calculating the 10 years moving average of city_avgtemp and global_avgtemp data using `=AVERAGE(D2:D11)`

For example: the moving average for 10 years from 1751, the city_avgtemp on cell 'D12' will be calculated using `=AVERAGE(D3:D12)`

10 yr moving average for New York temperature is calculated as shown below.

	A	B	C	D	E	F	G	H	I	J	K	L
1	year	city	country	city_avgtemp	global_avgtemp	NY 10yr MA	Global 10yr MA					
2	1750	New York	United States	10.07	8.72							
3	1751	New York	United States	10.79	7.98							
4	1752	New York	United States	2.81	5.78							
5	1753	New York	United States	9.52	8.39							
6	1754	New York	United States	9.88	8.47							
7	1755	New York	United States	6.61	8.36							
8	1756	New York	United States	9.94	8.85							
9	1757	New York	United States	8.89	9.02							
10	1758	New York	United States	8.15	6.74							
11	1759	New York	United States	9.01	7.99	8.567	8.03					
12	1760	New York	United States	7.73	7.19	<code>=AVERAGE(D3:D12)</code>	7.877					
13	1761	New York	United States	10.18	8.77	8.272	7.956					
14	1762	New York	United States	9.55	8.61	8.946	8.239					
15	1763	New York	United States	7.23	7.5	8.717	8.15					
16	1764	New York	United States	9.55	8.4	8.684	8.143					
17	1765	New York	United States	8.96	8.25	8.919	8.132					
18	1766	New York	United States	10.09	8.41	8.934	8.088					
19	1767	New York	United States	8.52	8.22	8.897	8.008					
20	1768	New York	United States	8.67	6.78	8.949	8.012					
21	1769	New York	United States	9.1	7.69	8.958	7.982					
22	1770	New York	United States	6.64	7.60	8.988	8.037					

10 year moving average for global temperature is calculated as shown below

results

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AVERAGE(E7:E16)

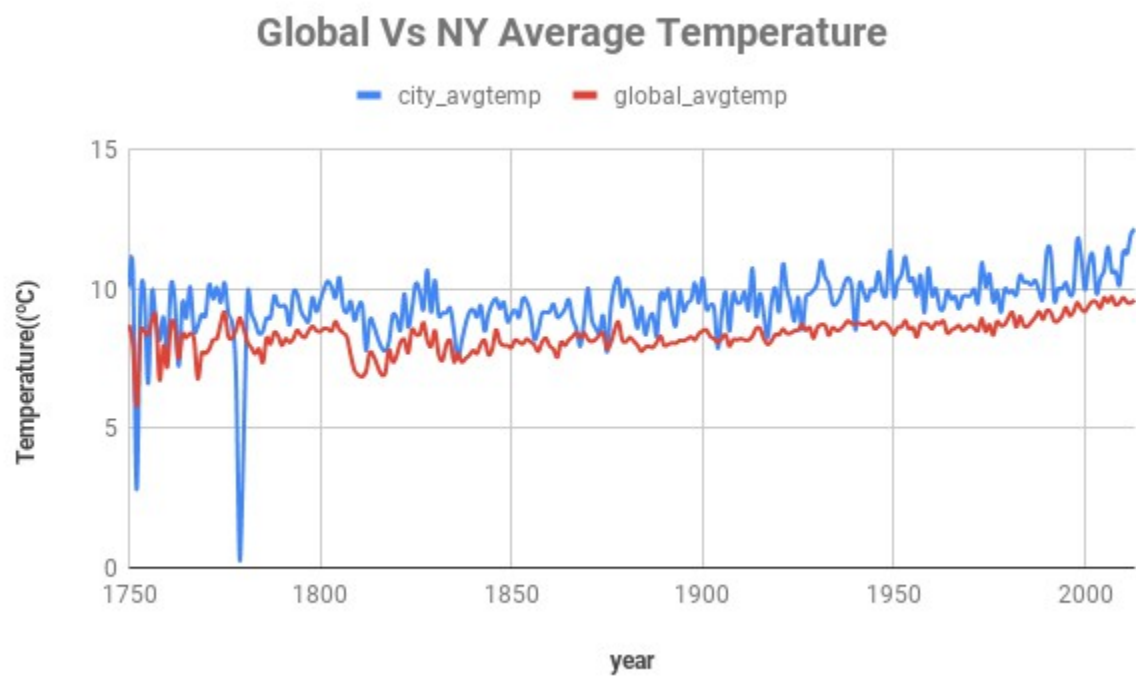
	A	B	C	D	E	F	G	H	I	J	K	L
1	year	city	country	city_avgtemp	global_avgtemp	NY 10yr MA	Global 10yr MA					
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results Chart2 Chart1 Explore

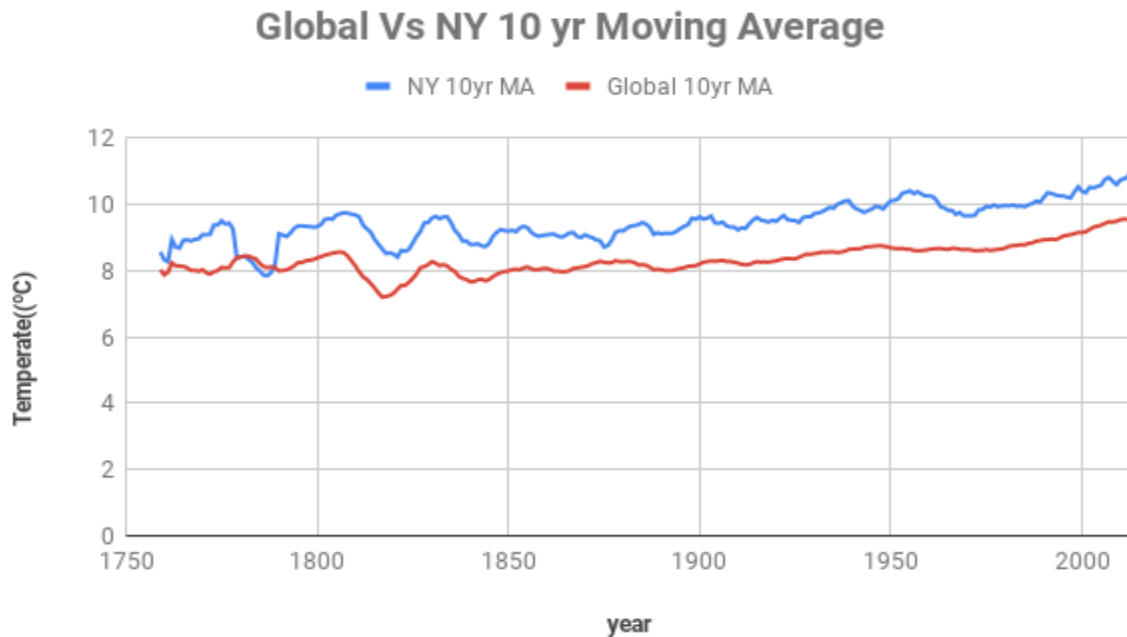
Data Visualization

Visualization is done by plotting line charts provided within google sheets.

This line chart shows Global Vs New York (local city) average temperature trends.



This chart shows moving averages for 10 years of Global Vs New York(local city) temperature trends.



Observation

Similarities

- 1) Starting from the year 1790 newyork city and global average temperature are both observed to be consistently increasing in the same pattern.
- 2) Observing the 10 yr moving average chart in year 1779-1781 both global and newyork average temperature are almost same.
- 3) The overall weather trend of both global and newyork city temperatures are increasing consistently over two centuries that means the world is getting hotter.

Differences

- 1) By looking at the 10yr moving average chart there is a sudden decrease in the newyork average temperature compared to global average temperature in the yr 1781 and then in the yr 1789 newyork average temperature is increasing over global average temperature.
- 2) By observing the overall average temperature chart the city(newyork) average temperature is very low in the yr 1752 compared to global average temperature.
- 3) Newyork average temperature is observed to be more hotter compared to the global average temperature for over two centuries.